REMARKS

Claims 1-20 are pending in this application.

Claims 1-20 have been examined and have been rejected.

Claims 1 and 3 have been amended and Claim 2 has been cancelled.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to withdraw the rejections and allow Claims 1 and 3-20, the only claims pending in this application after entry of the amendments set-forth herein.

Attached hereto is a marked up version of the changes made to the claims by the current amendment. The attached page is captioned **"Version With Markings to Show Changes Made"**.

No new matter has been added.

AMENDMENTS

Claim 1 has been amended to recite that the plurality of distinct microbial species includes at least one bacterial species and at least one fungal species. Support for this amendment can be found at least in the originally pending Claim 2, now canceled. Claim 3 has been amended to depend from Claim 1. The above amendments introduce no new matter to the application. Accordingly, entry of the above amendments by the Examiner is respectfully requested.

DECLARATION

The Examiner has stated that the Declaration of Thomas Yamashita under 37 CFR 1.132 filed 15 April 2002 is insufficient to overcome the rejection of Claims 1-20 based upon 35 USC sections 102 and 103, one reason being that the C.V. of Thomas Yamashita was not provided and therefore the qualification of Thomas Yamashita is unsubstantiated. The Applicant apologizes for this unintentional omission of Dr. Yamashita's C.V. and herewith submits Dr. Yamashita's C.V. which substantiates his qualification to speak as one of ordinary skill in the art.

The Examiner states that, secondly, even if the C.V. were evidenced in the declaration, the Declaration would still be found unpersuasive because the Declaration is not drawn to all of the species of bacteria and fungi cited to in the office action as the office action references the list of bacterial and fungal species found at page 5, middle para., of Reinbergen. As described in greater detail below, the Applicant respectfully submits that nowhere in the Reinbergen reference is it taught to pick and choose from the list provided by Reinbergen only those microorganisms that posses the claimed properties and

omit those microorganisms, such as those detailed in the Declaration, that do not posses the claimed properties. As such, Reinbergen can not anticipate the subject claims.

REJECTION UNDER 35 U.S.C. §102(b)

The Examiner has maintained the rejection of Claims 1-8, 10-13, 14 and 17-19 under 35 U.S.C. §102(b) as being anticipated by Reinbergen (WO 97/31879). The Applicant respectfully submits that the above cited reference does not anticipate Claims 1-8, 10-13, 14 and 17-19.

Under current case law, a reference does not anticipate a claim unless "all of the elements and limitations of the claim are found within [that]...reference....There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of invention." Scripps Clinic v. Genentech, Inc., 18 USPQ2d 1671, 1672 (Fed. Cir. 1992).

Therefore, in order for a claim to be anticipated by a reference, each and every limitation must be found in that reference. The Applicants respectfully submit that each and every claimed limitation is not found in the cited reference.

Independent Claim 1 as amended, and the claims that depend therefrom, recite a composition having a plurality of distinct microbial species, where each constituent member of the composition is: (a) antagonistic against a plurality of microbial pathogens; (b) non-pathogenic towards plants and animals; (c) is tolerant of high temperatures; (d) grows rapidly; and (e) proliferates on a complex substrate, **wherein the plurality includes at least one bacterial species and at least one fungal species**. Accordingly, to anticipate Claim 1 and the claims that depend therefrom, a reference must teach a microbial composition made-up of a plurality of distinct microbial species, each having every one of the above-described properties where the composition has at least one bacterial species and at least one microbial species.

The Examiner contends that Reinbergen discloses a composition having a plurality of distinct microbial species wherein each constituent member is antagonistic against microbe pathogens, non-pathogenic toward plant and animals, tolerant of high temperatures, grows rapidly, and proliferates on a complex substrate. The Examiner points to the list of various microorganisms in the middle of page 5 of the reference as evidence that each microorganism of the Reinbergen composition possesses each of the

claimed properties. However, the Applicant respectfully submits that not all of the microorganisms disclosed in Reinbergen posses all of the claimed properties and Reinbergen does not teach to pick and choose only those microorganisms that posses the claimed properties, nor does Reinbergen teach to pick and choose at least one bacterial species and at least one fungal species.

What Reinbergen does teach is a composition that includes microorganisms, and Reinbergen discloses exemplary microorganisms, i.e., bacteria, fungus and yeast, that may be included in the composition (page 5, lines 11-16; page 9, line 14 – page 10, line 5). Reinbergen also states that the composition may include a mixture of microorganisms. However, nowhere in the disclosure of Reinbergen is it taught that the composition is made-up of a plurality of microorganisms and that each microorganism that makes up the composition is antagonistic against microbe pathogens, non-pathogenic toward plant and animals, tolerant of high temperatures, grows rapidly, and proliferates on a complex substrate or is it taught to choose such microorganisms from the microorganisms disclosed. Furthermore, nowhere does Reinbergen teach that the composition includes at least one bacterial species and at least one fungal species, nor is it taught to choose at least one bacterial species and at least one fungal species from the microorganisms disclosed. As described in the Applicant's previous response to the Office Action dated January 31, 2002, microbial species, e.g., yeast species, taught by Reinbergen as appropriate for inclusion into the compositions do not posses the claimed characteristics.

Furthermore, nowhere in the disclosure of Reinbergen is it taught to select at least one bacterial species that possesses all the claimed properties and at least one fungal species that possesses all the claimed properties from the multitude of microorganisms provided by Reinbergen, while omitting all the microorganisms disclosed in Reinbergen that do not posses all of the claimed properties. As described previously, for example, Reinbergen repeatedly teaches the use of *Saccharomyces cerevisiae*. However, it is well known in the art that yeast species do not posses all of the claimed properties. Specifically, yeast species are not tolerant of high temperatures, which is a property claimed in Claim 1.

Furthermore, the Applicant submits that not only are yeast species preferred microorganisms in the compositions of Reinbergen, i.e., the compositions of Reinbergen preferably include microorganisms that do not posses all of the claimed properties, but that preferred compositions also do not include at least one bacterial species at least one yeast species. Accordingly, the Applicant directs the Examiner to the Examples section of Reinbergen. Example 1 teaches a solution 1 that includes (1) the yeast species

Saccharomyces cerevisiae (page 11, lines 15-16), and (2) a mixture of *Bacillus subtilis, Bacillus licheniformis* and *Macillus megaterium*. In other words, Reinbergen not only teaches the use of a microorganism that does not posses all the claimed properties, but Reinbergen also omits at least one fungal species, where the inclusion of at least one bacterial species and at least one fungal species is claimed in Claim 1. Example 1 also teaches a solution 2 that that is made up of the yeast species *Saccharomyces cerevisiae* and the bacterial species *Bacillus* (page 12, lines 1-2), i.e., solution 2 also includes a microorganism that does not posses all the claimed properties and does not include at least one fungal species. Furthermore, Example 1 teaches a solution 3 that includes the yeast species *Saccharomyces cerevisiae* (page 12, line 7) and the bacterial species *Bacillus* such that solution 3 also includes a microorganism that does not posses all the claimed properties and omits at least one fungal species.

Likewise, Example 2 teaches solutions that include the yeast/bacterial solution of Example 1 (page 13, lines 8-9), and thus teaches the use of microorganisms that do not posses all the claimed properties. Furthermore, the solution of Example 2 omits at least one fungal species, where the inclusion of such fungal species is claimed in Claim 1. Example 4 teaches the use of the solution taught in Example 1, i.e., a solution that includes a yeast species and does not include at least one fungal species. (Example 3 did not disclose the specific microorganisms in the composition.)

Therefore, at least three of the four examples disclosed in Reinbergen teach compositions having microorganisms that do not posses all of the claimed properties, i.e., include the yeast species *Saccharomyces cerevisiae*. Furthermore, at least three of the four examples of Reinbergen do not include at least one fungal species, as claimed in Claim 1.

Accordingly, nowhere does Reinbergen teach to pick and choose from the plurality of microorganisms disclosed in Reinbergen only those microorganisms that posses all of the claimed properties, while omitting those microorganisms that are disclosed that do not posses all of the claimed properties. Furthermore, nowhere in the disclosure of Reinbergen is it taught to include at least one bacterial species and at least one fungal species. In fact, preferred compositions taught by Reinbergen not only omit at least one fungal species, but they include microorganisms that do not posses all of the claimed properties. As such, Reinbergen does not teach all of the limitations of independent Claim 1 and the claims that depend therefrom, namely a composition having a plurality of distinct microbial

species, where each constituent member of the composition is: (a) antagonistic against a plurality of microbial pathogens; (b) non-pathogenic towards plants and animals; (c) is tolerant of high temperatures; (d) grows rapidly; and (e) proliferates on a complex substrate and include at least one bacterial species and at least one fungal species. Therefore, for at least the reasons described above, i.e., because Reinbergen does not teach each and every limitation of independent Claim 1, and the claims that depend therefrom, the claims are not anticipated by Reinbergen.

The Examiner has also maintained the rejection of Independent claim 10, and the claims that depend therefrom, as being anticipated by Reinbergen. Claim 10 recites a composition having a plurality of distinct microbial species made up of at least 5 different bacterial species and at least 2 different fungal species, wherein each constituent member is antagonistic against microbe pathogens, non-pathogenic toward plant and animals, tolerant of high temperatures, grows rapidly, and proliferates on a complex substrate.

Reinbergen teaches a composition that includes microorganisms and lists various microorganisms suitable for use, some of which do not posses all of the claimed limitations. However, while Reinbergen teaches that mixtures of microorganisms may be employed, nowhere in the teachings of Reinbergen is it taught that the compositions must have at least 5 different bacterial species and at least 2 different fungal species, each of which possesses all of the claimed limitations. In fact, none of the specific examples of compositions taught in Reinbergen even include at least 5 different bacterial species and at least 2 different fungal species.

Accordingly, Reinbergen fails to teach each and every claimed limitation, i.e., a composition that has at least 5 different bacterial species and at least 2 different fungal species, and therefore does not anticipate independent Claim 10 and Claims 11-12 that depend therefrom.

The Examiner has maintained the rejection of Independent claim 13 as being anticipated by Reinbergen. Claim 13 incorporates the composition of Claim 1. Accordingly, for reasons analogous to those described above with respect to Claim 1, The Applicant respectfully submits that Reinbergen does not anticipate Claim 13 and respectfully requests that this rejection be withdrawn.

The Examiner has also maintained the rejection of independent Claim 14, and dependent Claims 17-19, as being anticipated by Reinbergen. Independent Claim 14 recites a method of producing a composition according to claim 1 and thus includes a composition of microorganisms where each microorganism possesses all of the properties of Claim 1, and which composition includes at least one bacterial species and at least one fungal species.

As described above, Reinbergen does not disclose the composition of Claim 1 and as such does not disclose a method of producing a composition according to Claim 1 that includes identifying a plurality of microbial species that have the claimed properties and combining the plurality, where the plurality includes at least one bacterial species and at least one fungal species.

Accordingly, Reinbergen fails to teach each and every claimed limitation, i.e., a method of producing a composition according to claim 1, and therefore does not anticipate independent Claim 14 and Claims 17-19 that depend therefrom.

REJECTION UNDER 35 U.S.C. §103

The rejection of Claims 15 and 20 under 35 USC §103 as being unpatentable over Reinbergen (W0 97/31879) have been maintained. The Applicant respectfully submits that Claims 15 and 20 are not unpatentable under 35 U.S. C. §103 over Reinbergen.

The M.P.E.P. provides clear guidance on the requirements of a *prima facie* case of obviousness:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." M.P.E.P. § 2142.

Thus, the cited reference must teach or suggest all of the limitations of the claimed invention for the claimed invention to be rendered obvious over the reference. Claims 15 and 20 depend from claim 14. Accordingly, reasons analogous to those described above, i.e., Reinbergen fails to teach or even

suggest a process for making the composition according to Claim 1, a proper *prima facie* case of obvious can not be met. Accordingly, the Applicants respectfully request that the rejection of Claims 15 and 20 under 35 U.S.C. §103(a) over Reinbergen be withdrawn.

The Examiner has also rejected Claims 9 and 16 under 35 U.S.C. §103(a) as being unpatentable over Reinbergen in view of Kosanke et al. (US 5,695,541). The Applicant respectfully submits that Claims 9 and 16 are not unpatentable under 35 U.S. C. §103 over Reinbergen in view of Kosanke et al.

Claim 9 depends from Claim 1 which recites a composition having a plurality of distinct microbial species, where each constituent member of the composition is: (a) antagonistic against a plurality of microbial pathogens; (b) non-pathogenic towards plants and animals; (c) is tolerant of high temperatures; (d) grows rapidly; and (e) proliferates on a complex substrate and which includes at least one bacterial species and at least one fungal species. As described above, Reinbergen does not teach or suggest such a composition. As Kosanke et al. is cited solely for growing microbes on complex substrates, Kosanke et al. fail to overcome the deficiencies of Reinbergen. Accordingly, the Applicant respectfully submits that a proper *prima facie* case of obvious can not be met. Accordingly, the Applicants respectfully request that the rejection of Claim 9 under 35 U.S.C. §103(a) over Reinbergen in view of Kosanke et al. be withdrawn.

Claim 16 depends from Claim 15. As described above, Reinbergen fails to teach or even suggest a process for making the composition according to Claim 1. As Kosanke et al. is cited solely for growing microbes on complex substrates, Kosanke et al. fail to overcome the deficiencies of Reinbergen. Accordingly, the Applicant respectfully submits that a proper *prima facie* case of obvious can not be met. Accordingly, the Applicants respectfully request that the rejection of Claim 16 under 35 U.S.C. §103(a) over Reinbergen in view of Kosanke et al. be withdrawn.

CONCLUSION

In view of the above amendments and remarks, this application is considered to be in good and proper form for allowance and the Examiner is respectfully requested to pass this application to issue.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required by this paper, or to credit any overpayment, to Deposit Account No. 50-0815, reference no. YAMA-008.

Respectfully submitted,
BOZICEVIC, FIELD & FRANCIS LLP

Date: 8.26.02 By: _____
Bret E. Field
Registration No. 37,620

Date: 8/26/02 By: _____
Susan C. Tall
Registration No. P-52,272

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend the claims as follows:

1. (Amended) A composition comprising a plurality of distinct microbial species, wherein each constituent member of said plurality is:

(a) antagonistic against a plurality of microbial pathogens;

(b) non-pathogenic towards plants and animals;

(c) is tolerant of high temperatures;

(d) grows rapidly; and

(e) proliferates on a complex substrate,

wherein said plurality comprises at least one bacterial species and at least one fungal species.

Please cancel Claim 2.

3. (Amended) The composition according to Claim ~~2~~ 1, wherein said plurality comprises at least 5 distinct microbial species.

#7
09/695531

THOMAS T. YAMASHITA

EDUCATION

Ph.D. Plant Pathology, University of California, Davis [1985]
Master & Bachelor of Science, Plant Science, California State University, Fresno (1979)

RESEARCH EXPERIENCE

President / Chief Science Officer, 2/95 – Present
SUNBURST Plant Disease Clinic, Inc., FUSION 360 & TimCo Technology / Turlock, CA

Projects Completed & Ongoing

- Research & Development of Innovative, Safe Technologies and Products for Agriculture
- Characterizing Soil Chemistry and Biology of Diseased Date Palm Groves
- Overcoming Salt Stress and Alternate Bearing For Avocados In San Diego County
- Increasing Fruit Size Development In Valencia Oranges
- Remediating Tannic Acid Contaminated Collection Ponds
- Remediating Herbicide Contaminated Soils and Symptomatic Plant Species
- Bioremediation of Various Families of Persistent Herbicides In Soil
- Managing Virus Diseases by Induced Physiological Resistance through Manipulation of Key Nutritional Parameters
- A Novel Method of Managing the Threat & Ravages of Pierce's Disease of Grapevines
- Achieving Quantum Yields & Quality from an Average Producing Fruit & Nut Farm
- Biological & Cultural Control Systems for Powdery Mildew in Vineyards
- Biological Control of Wireworm in Sweet Potato Culture: A Model for All Situations
- Viable, Alternatives to Preplant Fumigation
- Well-Timed Nutritional Sprays to Mitigate Photorespiration and Onset of Noninfectious Bud Failure of Almonds
- A New Physiological & Morphological Variant of Downey Mildew in the Central Valley
- The Origin of Growth Response in Plants to Soil & Foliar Applications of Phosphorous Acid
- Epidemiology of Botrytis Bunch Rot in Wine Grapes
- Pesticide Resistance in Citrus Red Scale
- Selected Microbial Enhancement of the Soil: A Viable Means to Control Soil-Borne Pathogens
- Control of Mealybug in Vineyards
- Noninfectious Shothole of Plums: Its Origin As Related to Boron & Calcium Nutrition
- Cultural Practices to Minimize Stone Fruit Diseases
- Mouldy Core of Fuji Apples: Epidemiology & Control
- Development of Buffers for Silicone-Based Surfactant Phytotoxicity
- Investigating Herbicide Toxicity in Orchards
- Nematode Control in Vineyards and Stone Fruit Orchards
- Disease Diagnosis of Various Crops
- Free-Living Nematode Analysis as a Viable Tool for Measuring Soil Microbial Activity
- Ink Spot of Peaches
- Satellite Imaging: Coordinating Photos to Ground Exams
- Russetting of Nectarin s and Plums
- Mineral Toxicity in Nectarine Orchards
- Wet Feet Damages to Orchards from 1995 Rains

- Specialized Compost Products for Agriculture
- Downey Mildew: A Predisposing Agent of Bunch Rot in San Joaquin Valley Vin yards
- Lettuce Drop: Examination for Resistance and/or Tolerance to Iprodione
- *Cladosporium species:* A Formidable Predisposing Factor of Various Diseases
- Overcoming Alternat Bearing in Avocado Culture
- Overcoming Alternate Bearing in Hazelnut Production
- Bioremediation of Chlorinated Hydrocarbon Pesticides
- Bioremediation of Wine Effluent-Laced Soils
- Overcoming Physiological Bunch Shrivel in Wine Grapes
- Securing High Tissue Integrity & Enhanced Resistance to Transplant Shock in Vegetable Seedlings
- Mitigating Seedling Height Variation in Transplant Nurseries

Professor / Research Scientist, 6/94 – 2/95, California State University, Fresno [CSUF]

Projects Completed

- Control of Phylloxera & Instituting Recovery of Vineyards
- Bioremediation of Persistent Herbicides
- Mitigation of Osmotic Salt Stress in Young Germinating Seedlings
- Plant-Parasitic Nematode Management in Vineyards Using Nutritional & Microbial Factors
- Control of the Saprophytic State of *Coccidioides immitis* (Causal Agent of Valley Fever)
- Protocol for Control of *Armillaria mellea* in Vineyards
- Mitigating Noninfectious Bud Failure of Almonds
- Overcoming Alternate Bearing in Nut & Fruit Tree Culture

Lecturer / Research Scientist, 8/93 – 6/94, Department of Plant Science & Mechanized Agriculture and The Center For Irrigation Technology (1-94 – 2/95)

Projects Completed

- Bioremediation of Contaminated Farm Soils
- Bioremediation of Persistent Herbicides
- Composting Alternatives for Agricultural Wastes
- Pest & Disease Screening of Alfalfa Cultivars
- Soil Disease Suppression with Safe Alternatives to Pesticides

Consultant, 3/92 – 8/93, Intech One-Eighty Corporation / Logan, UT

Projects Completed

- Environmentally Safe Technologies: Alternatives to Pesticides in Agriculture
- Bioremediation of Xenobiotics
- Green Waste Tissues / A Potent Carbon Source For Culturing of Beneficial Microbes
- Beneficial Microbes Used in Bioremediation and Their Place in Soil-Borne Disease Control

President / Researcher / Consultant, 5/91 – 8/93
SUNBURST Research & Development / Pocatello, Idaho

Projects Completed

- Enhancing Carbon Partitioning in Vegetable, Field & Orchard C-3 Plant Species
- Utilizing Environmentally-Safe Alternatives to Soil Fumigation: Beneficial Fungi, Bacteria, Composts and Various Combinations
- Developing & Instituting Safe Alternatives: Insect, Mite & Disease Control
- Biodegradation of Assert Herbicide: To Mitigate Toxicity in The Grain Crop-To-Potato Rotation
- Developing & Instituting Environmentally-Compatible Systems: Physical & Chemical Maladies Associated with Alkaline and Acid Soils
- Synergistic Effects: Superior Plant Nutrient for Enhanced Fungicide & Insecticide Activity
- Quantitative & Qualitative Evaluation: Atrazine Toxicity & Establishment of Mathematical Models to Explain Persistence
- Chief Science Officer: Agricultural Development in The Commonwealth of Independent States (Royal Russet Enterprises, Aberdeen, Idaho)
- Integrated Systems Approach: Detoxification of Recalcitrant Chemicals and Pesticides
- Diagnoses: Soil-Borne, Foliar, Seed-Borne & Nonpathogenic Diseases
- Research & Development of Viable Alternatives To Natural Pollination in Various Orchard Crops
- Characterizing & Defining Enhanced Natural Resistance to Plant Pathogens: Nutritional Balances and Increased Metabolic Rates & Efficiency
- Estimating Energy Flux in Olive Trees: Leaf Canopy Density, Photosynthetic Rates & Desired Crop Loads
- Quantitative & Qualitative Analyses: Soil-Borne Plant Pathogenic Fungi & Nematodes
- Evaluation of Land Slopes & Orchard Crops: Effects on Water Infiltration Rates, Irrigation Efficiencies & Disease Incidence
- Alternate Bearing in Olive Trees: Deciphering A Chain of Causality for Cyclic Bearing
- Evaluation of Pollination Efficiency: Manzanillo-Ascolano-Sevillano Ratios & Probability for Effective Pollination
- Correlating Fertilizer Schemes to The Incidence of Verticillium Wilt
- Disrupting The Host-Finding Ability to Navel Orangeworm in Almonds
- Seed Coating With Antagonistic Microbes and A Sustaining Substrate
- Isolation, Evaluation & Field Testing of An Aggressive, Ice-Nucleation (-) Pseudomonad For Frost Protection in Orchard Crops
- Design & Construction of Pollen Processing Factory and Methodology for Use in Almond Orchards
- Alternate Bearing in Pistachio Trees: Energy Flux, Caloric Burdens, Inherent Photosynthetic Efficiency and Effects on Cyclic Bearing
- Characterization of Balanced Nutrition and Carbohydrate Flux in Pistachio Trees as A Primary Factor in Verticillium Wilt and Insect Pest Infestations
- Development and Field Testing of A Preventative Poultice: Ceratocystis Canker in Almond Trees
- Technology Development and Field Testing: Remission of Vascular Diseases With Fungicides and Selected Nutri nts
- Technology Development and Field Testing: Transplanting of Mature Orchard Trees
- Characterization of Noninf ctious Bud Failure in Almonds and Development of Technology for Remission and Prevention

- Non-Splits, A Physiological Disease of Pistachio Trees: Effects of Nutritional Balance & Carbohydrate Loads on Incident and Severity
- Commercial Culturing: Western Predatory Mite, A Biological Control Agent of Plant Mites
- Environmentally-Safe Control of Phylloxera in Vineyards
- Pesticide Phytotoxicity and Chemical Interactions in Cantaloupe Fields

Product Development Consultant, 4/89 – 5/91, Cargill, Incorporated / Minneapolis, Mn

Projects Completed

- Development, Patenting, Research & Test Marketing: Superior Foliar Plant Nutrients in Agriculture
- Development, Patenting, Research & Test Marketing: Environmentally-Friendly Technology for Control of Soil-Borne Pathogens and Plant-Parasitic Nematodes
- Development, Patenting, Research & Test Marketing: Control of Small-Bodied Arthropods

Technical Director, 4/87 – 4/89, West Hills Farming / Los Hill, CA

Duties

- Pest & Disease Control, Plant Nutrition, Cultural Operations [10,000 ac Almonds, 5,000 ac Pistachios, 40 ac Pecans]

Visiting Research Plant Pathologist, 6/86 – 4/87, University of California, Davis

Projects Completed

- Exploring Degradation as a Factor in Observed Tolerance and Resistance in Plant-Parasitic Nematodes to Nonfumigant Nematicides
- Control of Plant-Parasitic Nematodes of Turfgrass: Alternatives to Pesticides
- Voluntary Participation: Plant Pathology Clinic for Growers and Homeowners
- Lectures and Laboratory Sessions: Plant Nematology [Nematology 100]

Lecturer, 9/85 – 7/86, CSUF / Plant Science Department / Fresno, CA

Projects Completed

- Volunteer Plant Pathology Diagnostic Clinic

Lecturer, 9/84 – 1/85, University of California, Davis / Department of Nematology

Projects Completed

- Nematode-Plant Interactions [*Pratylenchus vulnus* – Grapevines, *Xiphinema index* – Grapevines, *Meloidogyne incognita* – Grapevines]

Graduate Study, 1/82 – 6/85, University of California, Davis / Department of Nematology

Projects Completed

- Nonfumigant Nematicides and Mod l Plant-Parasitic Nematodes: Charact rizing Tolerance, Resistance and Enzymatic & Biological Adaptations

Research Assistant, 1/82 – 6/82, University of California, Davis / Department of Nematology

Projects Completed

- Physiological Variations in Parasitic Nematode Species

Research Assistant, 9/81 – 1/82, University of California, Davis / Department of Pomology

Projects Completed

- Aminoethoxy Vinyl Glycine Treatments: Delaying Onset of Senescence in Stored Bartlett Pear Fruit
- Characterizing Cyanide-Insensitive Electron Transport Systems in Avocado Mitochondria
- Oxygen Consumption and ATP Synthesis in Avocado Mitochondria
- RNA and Protein Production in Cultured Pear Cells as A Model for Plant Cell Responses

Research Assistant, 3/79 – 7/80, Insect Research Laboratory, USDA / Fresno, CA

Projects Completed

- Development of Techniques for Mass Rearing of The Insect-Parasitic Nematode, *Neoaplectana carpocapsae*
- Feasibility of High-Pressure Orchard Sprayers for Insect Control With An Insect-Parasitic Nematode
- Biology of Carpenterworm (*Prinoxystus robiniae*) in Fig Orchards

RELATED EXPERIENCE

Farmer-Grower, 10/72 – 8/78, Atwater, CA

Projects Completed

- Control of Plant-Parasitic Nematodes Using Nonchemical Systems
- A Superior Foliar Nutrient Targeted at Supplementing Low Carbohydrate Levels In Orchard Crops
- Orchard and vine Crops Management
- Design and Construction of Specialized Farm Machinery
- Nonchemical Control of Insect and Mite Pests
- Characterization of Bacterial Canker of Peaches: Symptomatology; Effects of Nitrogen Fertilization; Effects of Topography; Effects of Fruit Load and Early Pruning

ACADEMIC EXPERIENCE

Professor, 8/92 – 2/95, CSUF, Department of Plant Science & Mechanized Agriculture
Undergraduate Courses: Introductory Plant Pathology; Plant Disease Diagnosis
Graduate-Level Courses: Statistics; Nematology; Disease Control

Lecturer, 9/86 – 4/87, University of California, Davis / Department of Nematology
Upper Division Course: Plant Nematology (Lecture and Laboratory)

Lecturer, 8/85 – 6/86, CSUF / Department of Plant Science & Mechanized Agriculture
Undergraduate Courses: Introductory Plant Pathology; Diseases of Fruit & Nut Crops; Diseases of Vegetable & Field Crops; Diseases of Ornamentals

Lecturer, 9/84 – 1/85, University of California, Davis / Department of Nematology
Upper Division Course: Plant Nematology (Lecture and Laboratory)

Teaching Assistant, 9/83 – 1/84, University of California, Davis / Department of Nematology

Graduate Assistant, 6/82 – 8/82, University of California, Davis / Department of Nematology

Lecturer, 7/78 – 9/78, California State University, Stanislaus / Turlock, CA
Undergraduate Course: General Biology

Teaching Assistant, 9/78 – 1/79, CSUF / Department of Plant Science
Undergraduate Course: Pomology

UNIVERSITY RELATED COMMITTEES, CSUF

- Scholarship Committee
- Undergraduate Curriculum Committee

PROFESSIONAL ACTIVITIES

- American Phytopathological Society
- Society of Nematologists
- American Society of Agronomy
- California Agricultural Production Consultants Association
- British Mycological Society

PATENTS

- Method and Composition for Promoting and Controlling Growth of Plants; US 5,549,729
- Method and Composition for Enhancing Pollination; US 9,614,930
- Control of Soil-Borne Pests and Pathogens; US 5,696,094
- Soil Amendment Compositions and Methods for Using the Same; US 9,222,459
- Foliar Fertilizer and Method for Using the Same; US 9,149,930
- Methods for Evaluating Nematode Control Programs; Pending – US 60,177,738
- Aqueous Mineral Compositions and Methods for Their Use; Pending – US 9,543,449
- Microbial Blend Compositions & Methods for Their Use; Pending – US 9,695,531

HONORS

- Cargill, Incorporated: Quality, Annual Recognition Science Award [1989-1990]
- Highest Teaching Evaluations, Department of Plant Science & Mechanized Agriculture, CSUF [1986; 1994; 1995]
- Highest Teaching Evaluations, Department of Nematology, University of California, Davis [1984]
- Nomination: Outstanding Graduate Student Teaching Award, Department of Nematology, University of California, Davis [1983]
- Highest Freestone Peach Production: California Canners & Growers [1974]
- Special Recognition Award For Teaching Excellence: From Students of CSUF Department of Plant Science [1994]
- Outstanding Leadership Award: Employees of Sunburst PDC and Fusion 360 [1996, 1997, 1998, 1999, 2000]

PROFESSIONAL OBJECTIVE

Improve the quality of life for mankind by providing expeditious, enlightened, grower-compatible solutions to a wide range of economically and life impacting problems in agriculture and the environment.